



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/811,294	03/26/2004	Kala Ramakrishnan	03108/0201084-US0	8262
7278	7590	11/08/2004	EXAMINER	
DARBY & DARBY P.C. P. O. BOX 5257 NEW YORK, NY 10150-5257			BOYKIN, TERRESSA M	
			ART UNIT	PAPER NUMBER
			1711	

DATE MAILED: 11/08/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/811,294

Applicant(s)

RAMAKRISHNAN ET AL.

Examiner

Terressa M. Boykin

Art Unit

1711

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 26 March 2004.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-9 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-9 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1-9 are rejected under 35 U.S.C. 102(e) as being anticipated by USPub 2003/0129092 note page 1, page 3 paragraph 0031 through page 4 paragraph 0037, examples 1-6 and claims 19-23.

USPub 2003/0129092 discloses a device for measuring and detecting a wide variety of analytes, including polyatomic anions, such as organophosphorus pesticides and nerve agents are provided. The device functions by selectively binding an analyte to a luminescent functionality-imprinted copolymer. The copolymers possess a securely bound luminescent lanthanide ion, such as Erbium, in a coordination complex that has been imprinted to bind the chemical functionality. Also provided are methods for producing the lanthanide-containing molecularly imprinted polymers of the invention. Specifically, the reference discloses the use of molecularly imprinted polymers comprising chelated lanthanides in methods and apparatus for detecting the presence

of an analyte. The imprinted polymers prepared therein anticipate the ion imprinted polymer particles claimed by applicants.

The imprinted polymer may employ any suitable monomer that provides an accurate imprint of the imprint molecule upon polymerization in addition to the crosslinking monomers and chelated lanthanide-analyte complexes to synthesize a MIP. Examples of suitable monomers include any of the complexing ligand monomers described above for forming a chelated lanthanide-analyte complex. Further suitable non-limiting examples of monomers that can be used for preparing a MIP of the present invention include: methylmethacrylate, other alkyl methacrylates, alkylacrylates, allyl or aryl acrylates and methacrylates, cyanoacrylate, styrene, alpha-methyl styrene, vinyl esters, including vinyl acetate, vinyl chloride, methyl vinyl ketone, vinylidene chloride, acrylamide, methacrylamide, acrylonitrile, methacrylonitrile, 2-acetamido acrylic acid; 2-(acetoxycetoxy)ethyl methacrylate 1-acetoxy-1,3-butadiene; 2-acetoxy-3-butenenitrile; 4-acetoxystyrene; acrolein; acrolein diethyl acetal; acrolein dimethyl acetal; acrylamide; 2-acrylamidoglycolic acid; 2-acrylamido-2-methyl propane sulfonic acid; acrylic acid; acrylic anhydride; acrylonitrile; acryloyl chloride; (R)-alpha-acryloxy-beta, 4-vinyl pyridine; 2-vinyl pyridine; 1-vinyl-2-pyrrolidinone; 2-vinyl quinoline; etc. Example I of the reference discloses the synthesis of a lanthanide complex compound wherein the lanthanide may be Er or erbium as shown on page 3 paragraph 0031 and Examples 3 and 4 disclose the method of making a polymer therefrom which further anticipate the preparation as claimed by applicants'. When polymerization is complete, the crosslinked polymer may be washed, cryogenically ground to a uniformly fine powder,

Art Unit: 1711

and/or extensively eluted with nonpolar solvents to remove any unreacted lanthanide-analyte complex. The steps of grinding and/or freezing in liquid nitrogen may be used to maximize surface area and allow for access by the various reagents and samples.

Freezing allows the polymer to become brittle enough to be ground and prevents distortions of the polymer by the heat of friction. The reference notes that polymers used in the construction of optical sensors may be prepared in situ on the distal end of an optical fiber whose surface is prepared by binding a polymerizable agent on the surface.

With regard to applicants' claim 2 and 3 note that the reference discloses that any UV or thermal free radical initiator known to those skilled in the art can be used in the preferred free radical polymerization. Examples of UV and thermal initiators include benzoyl peroxide, acetyl peroxide, lauryl peroxide, azobisisobutyronitrile (AIBN), t-butyl peracetate, cumyl peroxide, t-butyl peroxide; t-butyl hydroperoxide, bis(isopropyl)peroxy-dicarbonate, benzoin methyl ether, 2,2'-azobis(2,4-dimethylvaleronitrile), tertiarybutyl peroctoate, phthalic peroxide, diethoxyacetophenone, and tertiarybutyl peroxyvalate, diethoxyacetophenone, 1-hydroxycyclohexyl phenyl ketone, 2,2-dimethoxy-2-phenylacetophenone, and phenothiazine, and diisopropylxanthogen disulfide.

With regard to applicants' claims 4, 5, and 6 note that the reference discloses that any of a wide range of crosslinking monomers can be used according to the present invention. Suitable crosslinking monomers/agents that lend rigidity to the MIP are known to those skilled in the art, and include di-, tri- and tetrafunctional acrylates or methacrylates, divinylbenzene (DVB), alkylene glycol and polyalkylene glycol

Art Unit: 1711

diacrylates and methacrylates, including ethylene glycol dimethacrylate (EGDMA) and ethylene glycol diacrylate, vinyl or allyl acrylates or methacrylates etc.

Any suitable monomer that provides an accurate imprint of the imprint molecule upon polymerization may be optionally used in addition to the crosslinking monomers and chelated lanthanide-analyte complexes to synthesize a MIP in accordance with the principles of the present invention. Examples of suitable monomers include any of the complexing ligand monomers described above for forming a chelated lanthanide-analyte complex. Further suitable non-limiting examples of monomers that can be used for preparing a MIP of the present invention include: 2,2'-azobisisobutyronitrile; etc.

With regard to applicants' claim 9 the reference discloses that the polymers were sonicated for 2-4 hours at 60.degree. C. (Sonication is believed to help maintain homogeneity in the polymer.). After sonication, the partially polymerized material was placed in an oven at 60.degree. C. and allowed to cure overnight. The resulting block copolymers were ground to expose a larger surface area of the polymer and facilitate the removal of the imprinting ion. Once ground, the imprint ion is removed in two steps (Id.): (1) swelling in water and gradually increasing amounts of methanol to remove unreacted monomer and expand the polymer pores, (this produces accessible sites and facilitates the removal of the imprinting ion, and (2) removal of the imprinting ion by acid washing. Acid washing (pH of about 4.5) facilitates the removal of PMP and leaves in its place a weakly coordinated nitrate. The acid wash would anticipate the leaching step via the mineral acid or HCL as claimed by applicants'.

Thus the reference discloses a process for the synthesis of an ion imprinted polymer prepared from the same components as claimed by applicants. Thus in view of the above, there appears to be no significant difference between the reference(s) and that which is claimed by applicant(s). Any differences not specifically mentioned appear to be conventional. Consequently, the claimed invention cannot be deemed as novel and accordingly is unpatentable.

Correspondence

Please note that the cited U.S. patents and patent application publications are available for download via the Office's PAIR. As an alternate source, all U.S. patents and patent application publications are available on the USPTO web site (www.uspto.gov), from the Office of Public Records and from commercial sources. Applicants may be referred to the Electronic Business Center (EBC) at <http://www.uspto.gov/ebc/index.html> or 1-866-217-9197.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Examiner Terressa Boykin whose telephone number is 571 272-1069. The examiner can normally be reached on Monday through Friday from 6:30am to 3:00pm.

The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306. The general information number for listings of personnel is (571-272-1700).


Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR.

Art Unit: 1711

Status information for unpublished applications is available through Private PAIR only.

For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

tmb


Examiner Terressa Boykin
Primary Examiner
Art Unit 1711